CLAIMS

What is claimed is:

1. A method for generating a three-dimensional dataset, the method comprising the acts of:

acquiring a plurality of projection images from different locations on an arbitrary imaging trajectory; and

reconstructing the plurality of projection images to form a three-dimensional dataset.

2. The method as recited in claim 1, comprising the act of:

visualizing a selected volume of the three-dimensional dataset.

3. The method as recited in claim 1, comprising the act of:

processing at least one of the plurality of projection images, the three dimensional dataset, and a volume subset of the three-dimensional dataset using a CAD algorithm.

4. The method as recited in claim 1, comprising the act of:

processing at least one of the plurality of projection images, the three dimensional dataset, and a volume subset of the three-dimensional dataset prior to processing by a CAD algorithm or to visualization.

5. The method as recited in claim 1, wherein acquiring the plurality of projection images comprises:

emitting X-rays from one or more X-ray sources at a plurality of locations on the arbitrary imaging trajectory; and

generating at least one projection image corresponding to each location from which X-rays are emitted.

6. The method as recited in claim 1, wherein acquiring the plurality of projection images comprises:

moving an X-ray source along the arbitrary imaging trajectory;

emitting X-rays from the X-ray source at a plurality of locations on the arbitrary imaging trajectory; and

generating at least one projection image corresponding to each location from which X-rays are emitted.

7. The method as recited in claim 1, wherein acquiring the plurality of projection images comprises:

emitting X-rays from a plurality of X-ray sources, wherein each X-ray source may be positioned at one or more locations on the arbitrary imaging trajectory and wherein only one X-ray source is active at a time; and

generating at least one projection image corresponding to each location from which X-rays are emitted.

8. The method as recited in claim 7, wherein each X-ray source is stationary.

9. The method as recited in claim 1, wherein the three-dimensional dataset comprises mammography image data.

10. A tangible, machine readable media, comprising:

code adapted to acquire a plurality of projection images from different locations on an arbitrary imaging trajectory; and

code adapted to reconstruct the plurality of projection images to form a three-dimensional dataset.

11. The tangible, machine readable media, as recited in claim 10, comprising:

code adapted to visualize a selected volume of the three-dimensional dataset.

12. The tangible, machine readable media, as recited in claim 10, comprising:

code adapted to process at least one of the plurality of projection images, the three dimensional dataset, and a volume subset of the three-dimensional dataset using a CAD algorithm.

13. The tangible, machine readable media, as recited in claim 10, comprising:

code adapted to process at least one of the plurality of projection images, the three dimensional dataset, and a volume subset of the three-dimensional dataset prior to processing by a CAD algorithm or to visualization.

14. The tangible, machine readable media, as recited in claim 10, wherein the code adapted to acquire the plurality of projection images emits X-rays from one or more X-ray sources at a plurality of locations on the arbitrary imaging trajectory and generates at least one projection image corresponding to each location from which X-rays are emitted.

15. The tangible, machine readable media, as recited in claim 10, wherein the code adapted to acquire the plurality of projection images moves an X-ray source along the arbitrary imaging trajectory, emits X-rays from the X-ray source at a plurality of locations on the arbitrary imaging trajectory, and generates at least one projection image corresponding to each location from which X-rays are emitted.

16. The tangible, machine readable media, as recited in claim 10, wherein the code adapted to acquire the plurality of projection images emits X-rays from a plurality of X-ray sources, wherein each X-ray source may be positioned at one or more locations on the arbitrary imaging trajectory and wherein only one X-ray source is active at a time, and generates at least one projection image corresponding to each location from which X-rays are emitted.

17. An imaging system, comprising:

means for acquiring a plurality of projection images from different locations on an arbitrary imaging trajectory; and

means for reconstructing the plurality of projection images to form a three-dimensional dataset.

18. An imaging system, comprising:

an X-ray source configured to move along an arbitrary imaging trajectory;

a positioner configured to move at least the X-ray source;

a system controller configured to operate the X-ray source;

a detector configured to detect X-rays emitted by the X-ray source at different locations on the arbitrary imaging trajectory and to generate signals in response to the detected X-rays; and

a detector interface configured to acquire the signals from the detector.

19. The imaging system, as recited in claim 18, comprising:

a reconstruction workstation configured to reconstruct image data from the signals acquired by the detector interface.

20. The imaging system, as recited in claim 18, comprising:

a review workstation configured to display images reconstructed from the signals acquired by the detector interface.

21. The imaging system, as recited in claim 18, comprising:

a picture archiving system configured to store data from at least one of the system controller, a reconstruction workstation, and a review workstation.

22. An imaging system, comprising:

a plurality of X-ray sources, wherein each X-ray source is located at different location on an arbitrary imaging trajectory and wherein each X-ray source is individually activated;

a system controller configured to operate the plurality of X-ray sources;

a detector configured to detect X-rays emitted by each respective X-ray source and to generate signals in response to the detected X-rays; and

a detector interface configured to acquire the signals from the detector.

23. The imaging system, as recited in claim 22, comprising:

a reconstruction workstation configured to reconstruct image data from the signals acquired by the detector interface.

24. The imaging system, as recited in claim 22, comprising:

a review workstation configured to display images reconstructed from the signals acquired by the detector interface.

25. The imaging system, as recited in claim 22, comprising:

a picture archiving system configured to store data from at least one of the system controller, a reconstruction workstation, and a review workstation.